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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/442,499	11/18/1999	KWOK KEUNG PAUL HO	CS99-065	5954

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EXAMINER
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GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/23/2003

21

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No. 09-442499	Applicant(s) Ho
Examiner George Goudreau	Group Art Unit 1763

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 8-03-06, Paper # 20
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 2-5, 8-10, 13-15, 19, 22, 25, 28, 31, 34-39 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 2-5, 8-10, 13-15, 19, 22, 25, 28, 31, 34-39 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-5, 8-10, 13-15, 19, 22, 25, 28, 31, and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et. al. (6,325,948) further in view of Su et. al. (1993').

Chen et. al. disclose a process for wafer less cleaning, and wafer less conditioning of a plasma etcher which is conducted in between the processing of batches of wafers through the etching chamber. The process is comprised of the following steps:

- A dirty TCP (i.e.-transformer coupled plasma etcher) type rie etcher is cleaned in a plasma which is comprised of (SF<sub>6</sub>-Cl<sub>2</sub>-O<sub>2</sub>) during a wafer less cleaning step.;
- The cleaned rie etcher is then conditioned (i.e.-seasoned) in a plasma which is comprised of (Cl<sub>2</sub>-HBr-O<sub>2</sub>) during a wafer less conditioning step.;
- A polysi layer on the surface of a wafer is then rie etched in a plasma which is comprised of (Cl<sub>2</sub>-HBr-O<sub>2</sub>-He) during a main etching step.;
- The polysi layer on the surface of a wafer is then over etched in a plasma which is comprised of (HBr-He-O<sub>2</sub>) during an over etching step.;
- The wafer less cleaning, and the wafer less conditioning steps are then repeated when needed prior to processing additional wafers through the plasma etcher.

This is discussed specifically in columns 3-5; and discussed in general in columns 1-8. This is shown in figures 1-6. Chen et. al. fail, however, to specifically disclose the following aspects of applicant's claimed invention:

- the specific usage of the type of plasma etching apparatus which is claimed by the applicant;
- the specific etching/ cleaning/ conditioning process parameters which are claimed by the applicant;
- the specific usage of a plasma which is comprised of (HBr-O<sub>2</sub>-NF<sub>3</sub>) to etch the polysi layers on the wafer; and
- the specific usage of a SiO<sub>2</sub> hard etch mask during the etching of the polysi layer

Su et. al. teach that it is desirable to use a plasma which is comprised of (HBr-NF<sub>3</sub>-O<sub>2</sub>-He) in combination with a SiO<sub>2</sub> hard etch mask when etching a Si layer. This is discussed specifically in the abstract; and discussed in general on pages 55-59 of Su et. al. This is shown in figures 1-12 of Su et. al.

It would have been obvious to one skilled in the art to employ the specific type of plasma etching apparatus which is claimed by the applicant to conduct the etching process taught above based upon the following. The usage of the specific type of plasma etching apparatus which is claimed by the applicant to conduct a plasma etching process is conventional or at least well known in the plasma etching arts. (The examiner takes official notice in this regard.) Further, this simply represents the usage of an alternative, and at least equivalent means for conducting an etching process to the specific means which are taught above.

It would have been obvious to one skilled in the art to employ a plasma which is comprised of (HBr-NF<sub>3</sub>-O<sub>2</sub>-He) in combination with a SiO<sub>2</sub> hard etch mask when conducting the polysi etching step in the process taught above based upon the teachings of Su et. al. that it is desirable to do so. Further, this simply represents the usage of an alternative, and at least

equivalent means for conducting the etching step taught above to the specific means which are taught above.

It would have been inherent that a similar etch residue to that formed in the etching process taught by Chen et. al. when the plasma etching process taught by Su et. al. was employed in the etching process taught above. The examiner cites the case law listed below of interest to the applicant in this regard.

In re Swinehart (169 U.S.P.Q. 226 (CCPA )) and In re Best (195 U.S.P.Q. 430 (CCPA )) state that when an examiner has reasonable basis for believing that functional characteristics asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be inherent characteristics of the prior art, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied upon.

Thus, it would have been obvious to one skilled in the art to employ the same cleaning/seasoning process taught by Chen et. al. when using the etching process taught by Su et. al.

It would have been prima facie obvious to employ any of a variety of different etch processing parameters in the etching/ cleaning/ conditioning processes which are taught above including those which are specifically claimed by the applicant. These are all well known variables in the plasma etching art which are known to effect both the rate and quality of the plasma etching process. Further, the selection of particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific etch process parameters in the etching/ cleaning/ conditioning processes which are taught above based upon In re Aller as cited below.

“Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to the effect both the rate, and the quality of the plasma etching process.

3. Claims 5, 10, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-The seasoning polymer layers which applicant recites as being formed in claims 5, 10, and 15 conflicts with the claims upon which these claims depend. (i.e.-The independent claims recite the usage of a wafer less seasoning process. A Si based polymeric residue would not form on the interior surfaces of the plasma etcher after the seasoning step is conducted in the process claimed above.)

4. Applicant's arguments with respect to claims of record have been considered but are moot in view of the new ground(s) of rejection.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number currently is (703) -308-1915. My telephone number will be changing to (571)-272-1434 at some time during December 2003 due to my relocation to the new patent office facility. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned currently is

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(703) -306-3186. My fax number will be changing to (571)-273-1434 at some time during December 2003 due to my relocation to the new patent office facility.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.



George A. Goudreau/gag

Primary Examiner/AU 1763